ISD Software Quality and IV&V Support Planning Guidelines

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Purpose

To provide guidance in project planning for software quality and IV&V support and the approach to acquiring resources to implement a successful software quality and IV&V program.

Scope

This guidance is to be considered by all Information Systems Division (ISD) mission software development systems that are classified as Class B or C software, as defined by NPR 7150.2, Software Engineering Requirements. These guidelines are specific only to the software assurance disciplines of Software Quality and Independent Verification and Validation (IV&V).

Guidelines

Software Assurance is the planned and systematic set of activities which ensure that software life cycle processes and products conform to requirements, standards, and procedures. Software assurance includes the disciplines of Software Quality, Independent Verification and Validation, Software Safety, Software Reliability, and Verification and Validation.

Software Assurance begins during mission formulation and focuses on opportunities for early error detection, problem prevention, and risk identification and mitigation.

Plan for Software Quality

1. For Class B and C software, the Office of Systems Safety and Mission Assurance (OSSMA) provides Software Quality (SQ) resources/support to ensure that software assurance activities are performed correctly and to a level commensurate with the software classification, as well as software complexity, criticality, and risk.
2. SQ support is established through either the Systems Assurance Manager assigned to the mission or the Assurance Management Office (that will work directly with the Software Manager or Product Development Lead (PDL) to assign resources).
3. SQ personnel develop a Software Quality Assurance (SQA) Plan that documents the goals, processes, and responsibilities required to implement an effective quality program.
4. SQ personnel provide independent and objective evaluations of software processes and products throughout the software life cycle and provide project management insight into the quality and maturity of the software. *Note: OSSMA SQ resources implement the Center's Process and Product Quality Assurance (PPQA) and are responsible for "objectively evaluating adherence" per the CMMI Generic Practice 2.9.*

5. Open communication between SQ personnel, the Software Manager, project personnel, and IV&V (when assigned) is encouraged and is essential to conducting a successful software assurance program.

NOTE: Software Manager or PDL must work with Code 300/IV&V and the project to engage independent/objective personnel to plan, perform and communicate process and product evaluations.

Independent Verification and Validation

6. For most Class B development software (and some Class C software), the NASA Independent Verification and Validation (IV&V) Facility provides IV&V support.
7. Projects are selected for IV&V based on results from the software assurance classification assessment (performed by Software Assurance) and a yearly review by an IV&V Board of Directors at NASA Headquarters.
8. All IV&V activities on projects selected for IV&V support are funded by Headquarters.
9. For those projects not selected, IV&V support may be negotiated directly with the IV&V Facility, but must be funded by the project. *Note: IV&V is not "mandatory" for those projects not selected and funded by Headquarters.*
10. After an initial Start-up assessment, IV&V develops an IV&V Plan (IVVP) that documents the scope of their activities, support requirements, and reporting approach. IV&V personnel focus on safety and mission critical software by conducting additional reviews and in-depth evaluations of life cycle products that carry the highest level of risk.
11. The Software Manager, PDL, or designated representative serves as the point of contact between IV&V and the software development team and is responsible for providing access to current software products and addressing all IV&V findings and/or recommendations.
12. A Center IV&V Liaison is also available to address project issues or concerns and to ensure consistency in the application of IV&V across all projects. The Liaison also supports the IV&V Board of Directors during their yearly selection of software projects.

References

- GSFC Software Assurance site. This site contains sample plans, templates, assessment checklists and other valuable tools for software assurance practitioners.
- IV&V (Independent Verification and Validation) site. This site provides an overview of the NASA IV&V Facility, their activities, research, and support to software engineering.
- NASA-STD-8739.8, NASA Software Assurance Standard
- NPR 7150.2, Software Engineering Requirements
- 303-PG-7120.2.1A, Procedure for Developing and Implementing Software Quality Programs

Change History

Version	Date	Description of Improvements
1.0	June 20, 2005	Initial approved version by CCB